Northrup. Arch. Pediat., N. Y., 1905, xxii, 192.
Oeri. Die Thoracentese, Stuttgart, 1876. Case 15
Oliver. Lancet, London, 1894, i, 26.
Parkinson. British Jour. of Child. Dis., London, 1905, ii, 337.
Peyrot. La Pleurotomie, Thèse de Paris, 1876.
Phalip. Du Pneumothorax accidentel (etc.), Thèse de Paris, 1900.
Riesman. Amer. Jour. Med. Sci., 1902, cxxiii.
Russell. St. Thomas' Hosp. Rep., London, 1899, xxviii, 465.
Secretan. Rev. méd. de la Suisse Rom., Genève, 1888, viii, 438.
Signeux. Les rayons de Roentgen et le déplacement du cœur à droite dans les grands épanchements de la plèvre gauche, Thèse de Paris, 1898.
Smith (Eustace). Clinical Studies of Disease in Children, London, 1887.
Tapret and Boulay. Arch. gén. de méd., Paris, 1888, 7. s., xxii, 91.
Variot. Bull. et mém. Soc. méd. d. hôp. de Paris, 1893, 3. s., x, 323.
Variot and Roy. Bull. et mém. Soc. méd. d. hôp. de Paris, 1901, 3. s., xviii, 1040.
Weil. Deut. Arch. f. klin. med., Leipzig, 1881, xxix, 364.
West. Lancet, London, 1895, i, 674.
Wilks. Brit. Jour. of Child. Dis., London, 1905, ii, 462.

THE DIFFERENTIAL DIAGNOSIS OF THE DISEASES HITHERTO GROUPED TOGETHER AS RHEUMATOID ARTHRITIS, CHRONIC RHEUMATISM, ARTHRITIS DEFORMANS, ETC.[1]

By P. Wm. Nathan, M.D.,

INSTRUCTOR IN ORTHOPEDIC SURGERY IN THE NEW YORK POLYCLINIC; ORTHOPEDIC SURGEON TO THE WASHINGTON HEIGHTS HOSPITAL, NEW YORK.

In my two previous papers[2] I endeavored to show that the various joint diseases hitherto known as rheumatoid arthritis, etc., could be classified upon a definite pathological basis. It remained to be proved whether this classification could be carried out clinically; that is, whether it would be useful in practice.

In the present paper I hope to show that these diseases have definite clinical symptoms, as well as definite pathological lesions; and that when these definite symptoms are understood the various diseases can be readily differentiated from one another clinically.

Leaving, for the moment, other considerations aside, it will be found that, clinically, all the diseases associated as rheumatoid arthritis, etc., can be divided into two great classes: (1) Those which begin acutely, with a more or less definite onset, a rise in temperature, general constitutional reaction, local signs of inflammation, followed by remission or intermission, with perhaps permanent but not progressive joint disability; and (2) those which come on insidiously, with no rise in temperature, a slowly progressive course with no intermissions, leading gradually and progressively to more or less complete joint disability. I shall speak of the first of these as the inflammatory or infectious forms, the second as the trophic forms.

---

[1] Read at a meeting of the Orthopedic Section of the New York Academy of Medicine.

[2] Amer. Jour. Med. Sci., January and April, 1906.

THE INFLAMMATORY FORMS.

Of the inflammatory forms, we can distinguish a number of subvarieties according to the onset, and, when it is known, according to the etiology.

TYPE A. The onset and early joint symptoms are mild. The temperature is never very high, and as these cases are usually not seen very early, the temperature and initial constitutional disturbance may be overlooked. The joint symptoms are mild; there is not much pain and only moderate swelling, redness, and effusion. In these cases proper treatment leads to complete recovery. The too early use of the affected joint, however, causes more or less complete permanent disability.

TYPE B. The difference between this and the previous type seems to be one of degree rather than kind. The temperature and initial constitutional reaction are more marked, and there is greater liability to permanent joint disability under adverse circumstances. In some of these cases, the glands in the neighborhood of the affected joints are swollen. These cases have been considered a separate type and called Still's disease. It is not, however, confined to children, but occurs also in adults, and (through the courtesy of Dr. E. Libman) I have seen a case in a man associated with apex solidification. In some of the cases I have seen figuring as Still's disease the small nodular swellings were not glands at all, but were due to localized tendosynovitis or a peculiar circumscribed tumor-like connective-tissue proliferation. Remissions and exacerbations and complete intermissions are common in both the above-mentioned types of disease.

TYPE C. The onset is stormy. The temperature is high and the constitutional reaction (acute toxemia) is severe. These are the cases which have sometimes been spoken of as fulminating rheumatism, and which I consider analogous to the so-called cryptogenetic septicemias.[1] Visceral (endocardial and renal) complications are common. Usually a number of joints are red, swollen, and very painful. After a severe illness, which is usually considered an attack of rheumatism, the joints are found much deformed and stiff. These patients are prone to recurrences after complete intermissions, and either the same joints or previously normal joints are then affected. For a time after the initial attack or the recurrence the joint disability increases to a certain extent, but no new joints are involved, unless there are actual recurrences, and after a time, though the disability present is permanent, it is not progressive.

After the subsidence of the acute attack we can distinguish two distinct classes of cases within this type, according to the joint condition. In one, the capsule is found to be much thickened and

---

[1] See my paper in AMER. JOUR. MED. SCI., January, 1906.

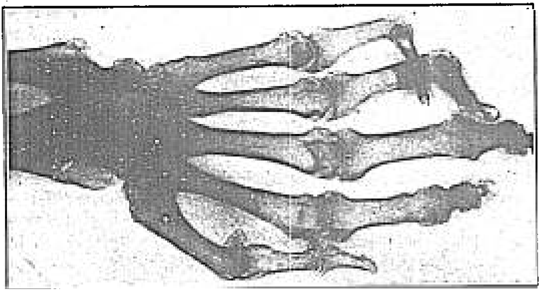

FIG. 1.—Infectious osteoarthritis, so-called arthritis ankylopœtica, showing bone spurs, bony ankylosis, and rarefication.

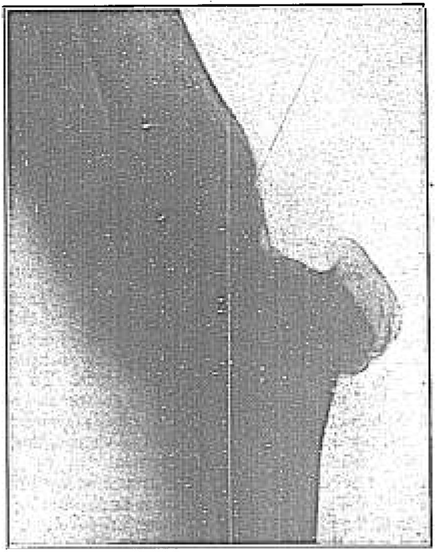

FIG. 2.—Infectious osteoarthritis of the knee, showing complete bony ankylosis.

there is marked contraction of the soft parts, whilst the bones, when they can be palpated, are found to have retained their normal contour. In the second class, though there is occasionally effusion, there is little or no swelling of the soft parts, but the articular ends of the bones which can usually be palpated are found to have lost their normal contour. In these cases the tendency is to complete bony ankylosis. The first of these I call infectious arthritis, the second, because of the evident bone involvement, infectious osteoarthritis.

It is very important, from a pathological and clinical, as well as the therapeutic, standpoint that these two forms should be differentiated from each other. For this purpose the x-rays are of great advantage. If they can be used early the differential diagnosis can be made during the acute attack. In the osteoarthritic form the x-rays show marked bone rarefication at a very early stage, sometimes within the first week. Later on, the x-rays show bone distortion, bone spurs, and bony ankylosis in osteoarthritis, whereas there is never any bone change in arthritis at any time. I reproduce the x-ray pictures (Figs. 1 and 2) of the hand and the knee of a case of infectious osteoarthritis, which show the bony ankylosis very distinctly. Fig. 3 is a photograph of the hands. To compare with them I show you a photograph (Fig. 4) and an x-ray picture (Fig. 5) of the hands of a case of infectious arthritis (synovial form). In the latter it is evident that there is no bone change, though this picture was taken some years after the attack.

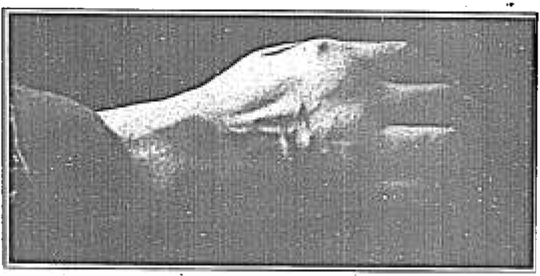

FIG. 3.—Hand in infectious osteoarthritis, showing characteristic deformity. Complete ankylosis of the fingers and wrist.

The x-ray pictures demonstrating the infectious osteoarthritis were taken from a woman who had two distinct acute attacks; almost all the joints of the body including the spine are involved. These were affected at the time of the first or second attack and those which were not involved then (the ankles, the right elbow, and the left knee) are still normal. The ultimate result of infectious osteoarthritis has been described by pathologists as arthritis ankylopœtica. As these patients may be perfectly well, aside from the permanent joint disability, and live many years after recovering from the acute infection, the specimens obtained before the days of the x-rays were usually found long years after the acute symptoms had subsided in individuals without a clinical history; hence, the name was given simply to indicate the postmortem findings. With the x-rays at our disposal and the increased knowledge of the infectious diseases we are now enabled to distinguish the condition clinically and definitely to classify it.[1]

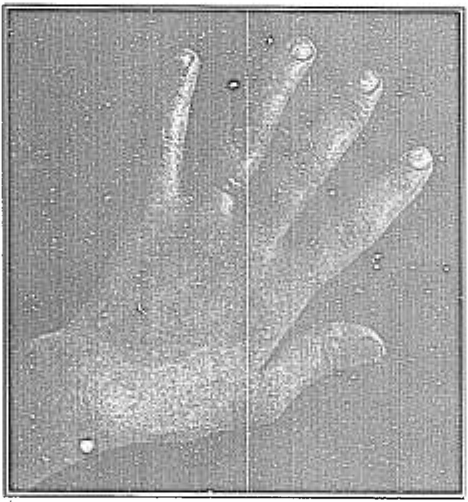

FIG. 4.—Infectious arthritis after subsidence of the acute attack, showing atrophy of the oints and deviation of the fingers (passive motion free). The radiogram in this case shows no bone lesion.

TYPE D. In a fourth type of cases the joint affection is associated with definite and well-known infectious diseases, and the causative micro-organisms have not infrequently been found in the joints. The most common are the pneumococcic, typhoid, and gonorrhœal joint diseases. These, like the infectious joint diseases of unknown origin, may occur as arthritides or osteoarthritides, and the differential diagnosis between the two forms can be made in the same way as the previous type. The joint disease may come on at any time during the course of the general disease or even after it has subsided. It may be monoarticular or polyarticular. The synovial forms are the most frequent, but osteoarthritis is not so uncommon as one might suppose. This applies particularly to the gonorrhœal forms, which, as is well known, sometimes run a very malignant course and result in bony ankylosis. The rapid rarefication of the bones which occurs in the early stages of the gonorrhœal osteoarthritides can be demonstrated by x-ray pictures (Kienbock and others). The joint complications of measles, scarlet fever, and diphtheria are usually very mild, and are most likely due to the toxemia rather than to a direct invasion of the joints.

---

[1] In young children the septic osteoarthritides are very likely to be suppurative, so for instance the acute epiphysitis of infancy, etc.

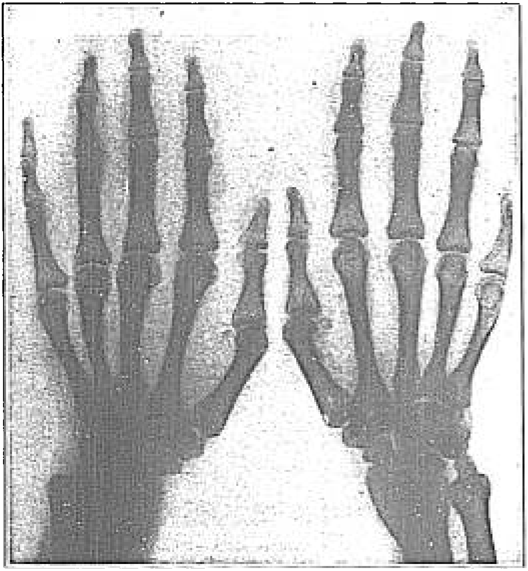

FIG. 5.—Radiogram of hands shown in Fig. 4. Shows total absence of bone involvement.

Without the history of a specific infectious disease it is not possible, in the present state of our knowledge, to say positively what the causative micro-organism is in a given case of infectious joint disease, unless the micro-organism itself can be found and demonstrated. This is true of all forms of infectious joint disease, particularly after the acute stage has subsided. The gonorrhœal forms, in which the very acute and exquisite pain, the tendency to para-articular invasion, with a very moderate rise in temperature, are characteristic, is a possible exception to this rule. It must be remembered, however, that these are not always present and that they are not absolutely pathognomonic.

Inasmuch as we are not, as yet, able to treat all the infectious diseases specifically, it seems to me more important, as far as treatment is concerned, to differentiate between infectious arthritis and infectious osteoarthritis, than to endeavor to find a distinct micro-organism for each case. Early diagnosis in osteoarthritis is very important because these cases must not be completely immobilized too long, but must receive graduated passive motion as soon as possible after the very acute symptoms have subsided. They must not, however, receive rough treatment and the patients must not be permitted to do weight-bearing for a considerable time after all symptoms have subsided. In the arthritides, because of the tendency to connective-tissue contraction, immobilization should be prolonged and passive motion and active function should not be exercised until long after all signs of joint symptoms have subsided.

The infectious joint diseases, be they synovial or osseous, may be monoarticular or polyarticular, and any or all of the joints, including the spine, may be affected. There is a rather peculiar form of infectious arthritis which almost always affects the knee-joint. This was first accurately described as a distinct affection by Schüller, who calls it arthritis villosa. The disease runs a subacute or chronic course and is characterized by an enormous proliferation of the synovial fringes. Schüller has excised the villi from the knees of a great many such cases and has found a peculiar bacterium which he considers the cause of the condition. As far as I know, no one has confirmed Schüller's findings as regards the bacteria, but the disease is common and has been recognized by a number of observers. The joint cartilages and bones in these cases are not affected.

THE TROPHIC JOINT DISEASES.

The chief clinical characteristic of the second class of joint diseases, that is, the trophic, is the insidiousness of the onset. The disease never comes on in attacks as in the inflammatory forms, and there is never elevated temperature or acute constitutional reaction. In fact, it nearly always comes on so insidiously that the patient himself is hardly able to tell when it began. Swelling, stiffness, and deformation come on gradually and progressively, and pain, though often present, is never acute or very severe.

Here, as in the infectious forms, we can distinguish two distinct groups of cases, the synovial and the osseous. The synovial forms are not nearly so characteristic or so common as the osseous forms. They come on at any age, very gradually, without much pain, and the peripheral joints are usually affected first. There is effusion and swelling of the soft parts. Some of these patients present well-marked signs of autointoxication, but in others I have been unable to demonstrate any other abnormality or symptom except the joint effusion and swelling. Fig. 6 shows the hands of such a case. The scar on the wrist is the result of an operation undertaken a number of years ago because of a mistake in the diagnosis. An exactly similar condition occurs when there is chronic bacterial toxemia, as in bronchiectasis, pulmonary tuberculosis, etc. The condition here is one of general disturbance of the nutrition and not a direct invasion of the joint by bacteria or inflammation. I have also seen such cases associated with diabetes and general arteriosclerosis. The latter, however, is more likely to cause trophic osteoarthritis. In

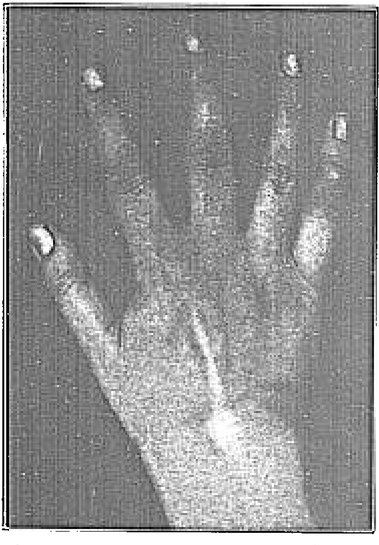

FIG. 6.—Hand of case of metabolic arthritis, so-called rheumatoid arthritis. The swelling is due to effusion. Passive motion is normal. Radiogram shows no bone changes.

trophic arthritis there is never bone involvement no matter how long the disease continues.

Of the osseous form, the trophic osteoarthritides, we can distinguish a number of distinct forms clinically. First, there is the very characteristic disease which, I believe, the earlier writers, such as Adams, Smith, Heygarth, Cruveilhier, etc., considered the type of what later became known as rheumatoid arthritis or chronic rheumatism. Of the more recent writers only Baumler (arthritis deformans) and Shuchardt (arthritis nodosa) describe it as a distinct disease. Goldthwait groups it as atrophic arthritis. In the classification I use in practice I call it metabolic osteoarthritis.

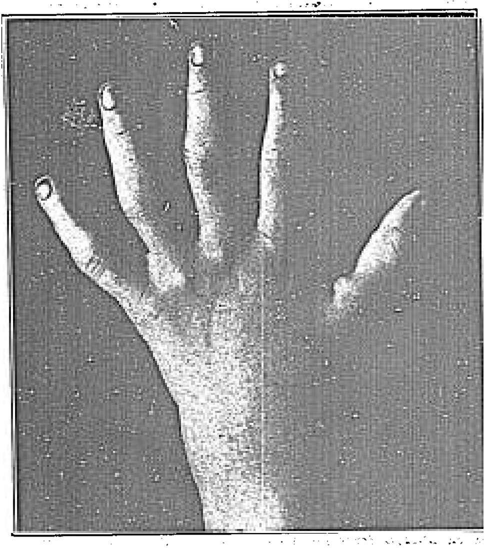

FIG. 7.—Hand of a child with metabolic osteoarthritis (arthritis deformans, Baumler), showing nodular swelling due to thickening of the periosteum and soft parts. x-rays show rarefication of the articular ends of the bones.

The disease begins with or without some premonitory signs of tingling or formication, almost invariably in the peripheral joints; thence it proceeds very gradually but persistently from joint to joint toward the trunk, and if the patient lives long enough (which in adults is usually the case) finally involves every joint in the body, including the spine. In children the disease advances rapidly but never acutely, and always without temperature. There is always a well-marked cachexia with general emaciation, and the disease seems to lead to complete disability and a fatal termination much more rapidly than in adults.

In adults the disease, though progressive and accompanied by a distinct cachexia, advances much more slowly or even in some cases comes to a standstill; and these patients, though more or less disabled, live many years.

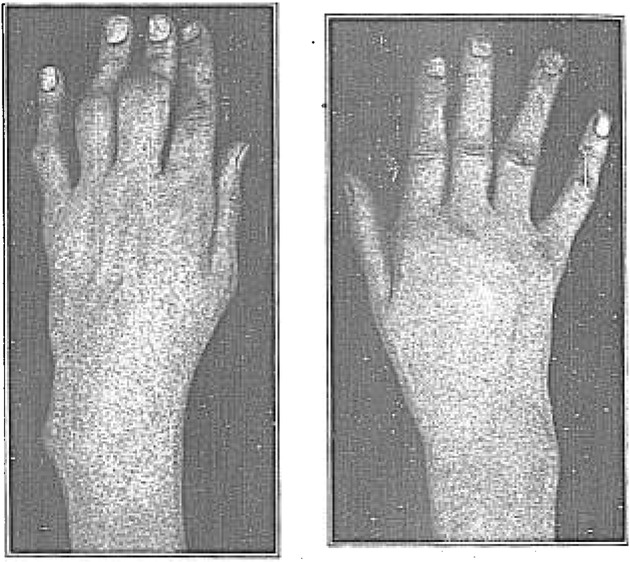

Fig. 8.—Hands of adult with metabolic osteoarthritis (arthritis deformans, Baumler; atrophic arthritis, Goldthwait; rheumatoid arthritis, Garrod), showing characteristic deformation.

The joint symptoms are characteristic. At first there is a gradual swelling and the joints assume the peculiar nodular appearance shown in Fig. 7. The swelling is not due to effusion but to a peculiar thickening of the soft parts, and in adults to periosteal enlargement besides.

In adults there may be no swelling at all; when it does occur it subsides after a time, whereupon a distinct change in the contour of the bones can always be made out. The articular ends of the bones undergo absorption from within, and in the smaller joints the absorption may be so complete that nothing at all remains of them. In this case the joints are subluxated or even completely dislocated and the hands become characteristically deformed (Fig. 8). Pain varies considerably and, as, in all joint and bone diseases, seems to be influenced by the weather. It seems to be much more severe in children than in adults.

In the more advanced stage there is nearly always a crackling noise when the joints are moved. As there is little or no tendency to connective tissue contraction and never bone ankylosis, there is no very marked limitation of passive motion. When limitation of motion exists it is due to voluntary resistance, joint spasm, or stiffness from prolonged immobilization.

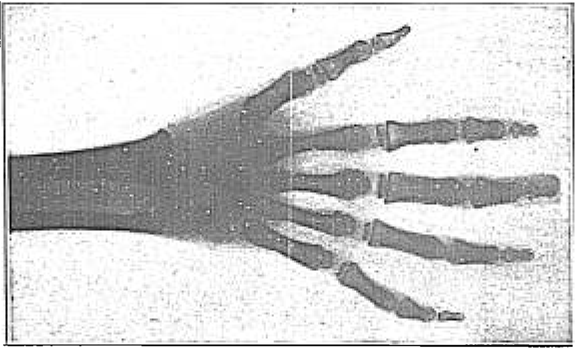

FIG. 9.—Radiogram of the hand shown in Fig. 7 showing rarefication of the articular ends of the bones.

The *x*-ray pictures are very characteristic. In the early stages there is decided rarefication of the articular ends of the bones, sometimes even of the shaft. Fig. 9 is the *x*-ray picture of the hand (Fig. 7) of a child with metabolic osteoarthritis, showing the rarefication and the thickening of the soft parts. There is no fluid in the joints. In the later stages the absorption of the articular ends can be plainly seen, as in Fig. 10, which is a radiogram of one of the hands shown in Fig. 8. There is never bony ankylosis; on the contrary, the separation between the articular surfaces increases.

The absence of inflammatory signs in the joints, the insidiousness of the course, and the pronounced cachexia readily distinguish this form of joint disease from the inflammatory or infectious forms. Long after the onset, when all symptoms except the deformation have disappeared, infectious osteoarthritis might be confused with it, though the ankylosis in the one and its absence in the other readily differentiate them. However, if this is not sufficient, the *x*-rays decisively clear up the diagnosis. In infectious osteoarthritis there will be found bone ankylosis and bony overgrowth. These are never present in metabolic osteoarthritis. Upon comparing Figs. 1 and 2 with Fig. 10 this difference is evident.

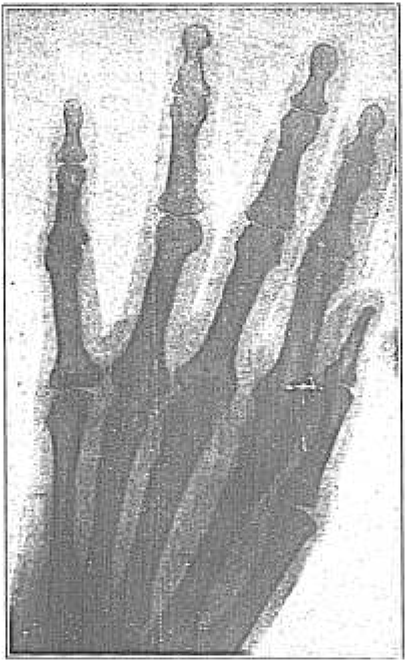

FIG. 10.—Radiogram of one of the hands shown in Fig. 8—metabolic osteoarthritis with atrophy and absorption of the articular ends of the bones. Note the total absence of bony overgrowth.

A mild form of osteoarthritis is often found associated with psoriasis, though not so many joints are involved. The course, the symptoms, and the *x*-ray pictures correspond exactly with those of metabolic osteoarthritis. All the cases of joint disease associated with psoriasis which have come under my observation have been cases of metabolic osteoarthritis. Dr. Osgood, of Boston, however, informs me that he and Dr. Goldthwait have seen cases of simple metabolic arthritis associated with it. All the cases of joint diseases I have seen associated with eczema have been arthritides. It must be remembered that these joint diseases are due to general metabolic abnormalities and that all forms of trophic skin and nail lesions are common in these conditions.

A second type of osteoarthritis is the very common disease generally known as senile arthritis, or, as it occurs in the hip, as *malum coxæ senilis.* This disease comes on at or past middle life, is very insidious, has very characteristic bony changes, but is not accompanied by a definite or marked cachexia. It is likely to be, but is not necessarily, monarticular. In the hip the clinical symptoms of bone disease are definite and decided; the affected extremity is shortened, the limb is adducted, and the trochanter is above Nélaton's line (bending of the neck of the femur or deepening or wandering of the acetabulum). As it occurs in the knee, elbow, or ankle there is no swelling at first, but later, as distortion goes on and the joints must perform their functions under abnormal conditions, the capsule becomes irritated mechanically and joint swelling, effusion, and proliferation of the synovial fringes supervene. Free or loose bodies are often found within the joint. In the smaller joints (phalanges) there is swelling due to periosteal proliferation—known as Heberden's nodes.

Senile osteoarthritis is readily distinguished from metabolic arthritis by the tendency to monarticular invasion, absence of pronounced cachexia, much slower progress, and the difference in the *x*-ray pictures. In senile osteoarthritis the bones are rarefied, but they never show the extreme absorption found in metabolic osteoarthritis, and the articular ends of the bones are never completely absorbed even in the smaller joints. In the larger joints the bones are bent and there are varying degrees of distortion depending upon the amount of pressure to which the bones have been subjected. The decisive characteristic in the picture of senile osteoarthritis is the pseudohypertrophic processes. They appear whenever the softened bones have been subjected to pressure or strain; and they consist of osteophytes at the insertion of the muscles and ligaments surrounding the joints, as extensions of the borders, spurs, or lipping. Fig. 11 is the radiogram of a case of senile osteoarthritis of the elbow, and shows the lipping of the head of the radius and a bony spur below the coracoid process of the ulna. These pseudohypertrophic processes are never found in metabolic osteoarthritis.

To distinguish senile from infectious osteoarthritis should rarely present any difficulty. The differences in the onset and the course of the two diseases are usually sufficient to differentiate them. Moreover, there is never complete loss of motion in senile osteoarthritis, whilst this is the rule in infectious osteoarthritis. Bony ankylosis is common in the latter and never present in the former.

A third form of trophic osteoarthritis is that associated with organic nervous disease. Any interference with the nerve supply of the bones may cause it, but the most common causes are tabes dorsalis and syringomyelia. The joint changes are an exaggeration of those found in senile osteoarthritis. At times the disease apparently comes on suddenly; but this is due to the fact that these patients have lost their pain sense and for this reason do not become aware of the joint abnormality until trauma or rough handling brings about acute joint irritation with its attendant symptoms. Not infrequently the bones are found to be very much distorted or even fractured without the patient's having been aware of his abnormality or having felt any discomfort. Not infrequently the capsule is torn and there is para-articular effusion. The joint effusion if it exists always subsides after rest.

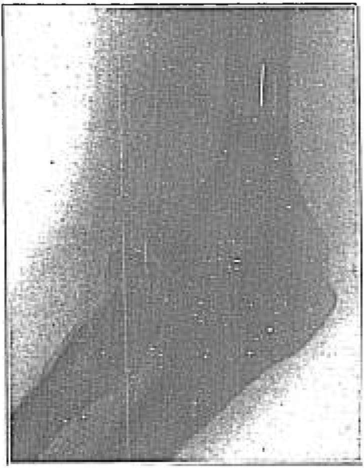

FIG. 11.—Senile osteoarthritis of the elbow. Shows the lipping, spurs, and pseudohypertrophic processes. Besides the rarefication, note the absence of ankylosis.

The disease is usually monarticular and the joint affected corresponds to the nerve lesion. x-ray pictures show the rarefication and the distortion of the bones. There is a marked tendency to more or less complete absorption of the articular ends of the bones, and fractures or breaking off of pieces of bone, which appear as free bodies, are common. Fig. 12 is the radiogram of the hip of a man with syringomyelia. In this case the disease is almost wholly confined to the acetabulum, which is so much enlarged and deepened that the head of the femur has entirely disappeared within it and does not show in the picture. The head of the bone, which I have removed, aside from rarefication and softening, shows no marked change. This acetabulum was so soft that it could be cut with a scalpel. The joint membranes were intact in this case.

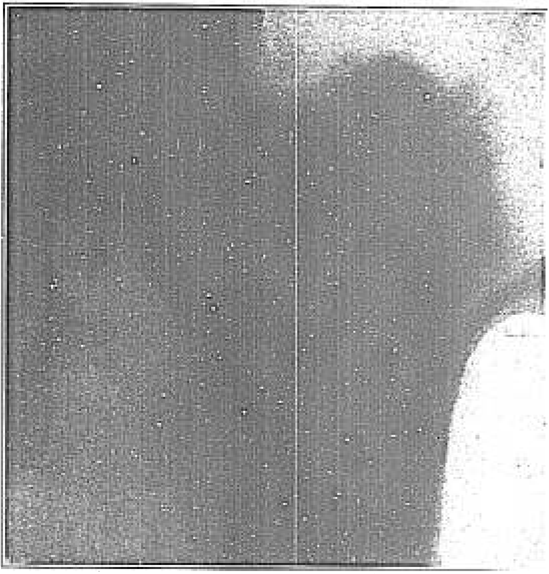

FIG. 12.—Radiogram of the hip joint in a case of neurotic osteoarthritis. The acetabulum is the affected part. Notice the great increase in depth which causes the head of the femur to disappear entirely from view.

The only joint disease with which neurotic osteoarthritis can be confused is senile osteoarthritis. The greater destruction not only of the bones but also of the soft parts, and the symptoms of nervous disease, readily clear up the diagnosis.

A mild form of trophic osteoarthritis also occurs in the course of certain chronic diseases in which the general nutrition suffers. Pulmonary tuberculosis and chronic bronchitis with bronchiectasis are the most common of these, and the joint disease, as well as the other signs of cachexia, are probably due to the chronic toxemia. There is rarely much joint destruction in these cases; the joints are usually swollen, not from an effusion but from periosteal proliferation of the articular ends of the bones. The x-rays show rarefication even where there is apparently much thickening. These changes also occur as a result of the general nutritional disturbance caused by organic heart disease. There is rarely much disability in these cases. The characteristic feature is the so-called club-fingers.

From the analysis of the symptoms and the x-ray findings of the so-called rheumatoid joint diseases here undertaken it must be plain that these diseases have, as a whole, no direct connection, except that they all affect the joints. We find that there are a number of conditions having distinct general or distinct local joint symptoms. These definite clinical entities, as has been shown in a previous paper, correspond exactly to distinct pathological conditions, so that there can be no doubt of their being distinct diseases.

The term rheumatoid expresses absolutely nothing when applied to these diseases, even when it is used simply as a group name. I am, therefore, of the opinion that it would be much better to drop it entirely from the nomenclature. It is meaningless in its present use, and has been and will be, if its use is continued, a constant source of confusion.

The objection to the various classifications of the joint diseases heretofore proposed is that the names used are not specific, or specific only to a certain extent, so that not infrequently it was necessary to use the same name for two different conditions. Moreover, the names used simply express external conditions and do not indicate distinct clinical and pathological conditions.

The classification I have proposed has at least the merit of indicating distinct clinical and pathological entities by distinct names. Moreover, it does not pretend to distinguish a rather vague group of joint diseases from all others, but is applicable to joint diseases generally. The names used are not absolutely new: they are simple, they consider the general as well as the local condition, and they definitely express both the clinical and the pathological phenomena.

The complete classification as it applies to the pathology will be found in my previous paper. I illustrate its use for clinical purposes in the following table of the differential diagnosis of the diseases here dealt with. I am much indebted to Dr. L. G. Cole for making the radiograms.

	Name.	Onset and course.	Joint changes.	Bone changes shown by x-ray.
INFLAMMATORY OR INFECTIOUS JOINT DISEASES.				
Synovial forms.	Infectious arthritis: mild type. Infectious arthritis: septic type. Infectious arthritis; Still's type. Gonorrhœal arthritis. Typhoid arthritis. Pneumococcus arthritis. Infectious villus arthritis, Schüller.	Acute to subacute attacks with temperature recurrent or intermittent. Comes on in the course of an infectious disease as in gonorrhœa, etc. Joint condition may be permanent but no new joints are involved after the attacks cease.	Effusive thickening of the soft parts; finally atrophy of the joint appendages.	No bone changes.
Osseous forms.	Infectious osteoarthritis; septic type. Typhoid osteoarthritis. Pneumococcus osteoarthritis. Gonorrhœal osteoarthritis.		Ankylosis.	Bony ankylosis and pseudohypertrophic processes, spurs, etc.
TROPHIC JOINT DISEASES.				
Synovial forms.	Metabolic arthritis. Arteriosclerotic arthritis. Toxemic arthritis.	Come on insidiously without temperature. Gradually progressive, new joints affected from time to time.	Effusive thickening of the soft parts. Ultimately atrophy of joint appendages.	No bone changes.
Osseous forms.	Metabolic osteoarthritis. Senile osteoarthritis. Neurotic osteoarthritis. Toxemic osteoarthritis.		Atrophy of joint structures.	In metabolic osteoarthritis rarefication and absorption of the articular ends of the bones; in the others rarefication plus pseudohypertrophic processes. There is never ankylosis in any of the trophic osteoarthritides.

EXOPHTHALMOS IN LEUKEMIA.[1]

By James B. Herrick, M.D.,
PROFESSOR OF MEDICINE, RUSH MEDICAL COLLEGE (UNIVERSITY OF CHICAGO), CHICAGO, ILLINOIS.

The following case is worthy of record, not only because of the rarity of exophthalmos in leukemia, but because it will serve as a means of calling attention to the whole subject of lymphoid tumors in and around the eye, a subject not limited in its interest to the oculist, but concerning the general physician as well. I am indebted to Doctor N. Senn for the privilege of seeing the patient and reporting the case, as well as to Doctor C. Volini, under whose care the patient had been at one time, for many of the facts of the earlier history. Omitting non-essentials, the history is as follows:

P. B. was an Italian laborer, twenty-two years of age, of good habits and without discoverable hereditary or acquired taint of

---

[1] Read at the meeting of the Association of American Physicians, Washington, D. C., May 15 and 16, 1906.